Marbled Murrelet Effectiveness Monitoring
Population Team Meeting September 9, 1999

In Attendance:
Steve Beissinger, UC Berkeley
Naomi Bentivoglio, FWS
Jeff Laake, NMFS
Tim Max, FS PNW
Sherri Miller, FS PSW
Ken Ostrom, FWS
CJ Ralph, FS PSW
Marty Raphael, FS PNW
Chris Thompson, WDFW

Major Topic of Discussion: 2000 Sampling Design for Murrelet Populations at Sea

SB began the meeting with an overview of his computer-simulated population surveys (for copies of this report, see SB). Divided the survey area into two offshore strata. First zone is 1 km wide beginning 500m from shore and extending 1.5km off shore. Strata 2 is 1.5 km wide (beginning 1.5 km and extending 3km from shore). This area was based on bird density distributions as mentioned in previous chapters. Looked at a variety of transect layout or design configuration possibilities as suggested from the Population EM Group. Deliberated maximum transect lengths/distance, boating logistics and safety, and what density estimators were being used. They decided to set the total transect length and survey area to 80 linear kilometers. (Note zigzag transects traveled slightly greater distances) After the computer run, the density for each strata was estimated. Each strata was weighted for determining the total density estimate of murrelets.

Most of the designs researchers have used to date have been population indices (i.e. 1-2 transects parallel to shore). They looked at several population indices but also looked at eight configurations of population estimators. The best zigzag design transects are 15 degree reflection angle. The 15 degree design performed better than the 25 degree simulation as it handled both the uniform and clumped distribution of bird models with less bias and more power. The 15 degree reflection has a slighter angle. The best parallel transects were the 7 km on and 3 km off, the 5 km on and 5 km off worked equally as well. However there were some questions and concerns about the biases. Why do the unstratified configurations give higher biases? Not sure about this. All estimates (except the indices) should be unbiased. And the clumped along shore distributions shouldn't give extra bias either. Is the entire target population of birds placed within the area from 500-3000 m or does some portion extend beyond? SB will clarify. Suggest SB keep all the animals in the box (sample unit) and check again regarding the biases. Also some calculations may need to be done again.

CT provided a handout, showing the difference of bird counts for different off coast transect locations. Selecting a distance off shore should be based on the existing data available for different geographic areas.

Need to define Replicate. Is it one sampling day or one transect or some other defined block? Should a transect be performed in one direction? In some areas the environmental conditions and locations for boat deployment make it difficult to do single long transects. Currently use 60 km transects which are 30 km's out and 30 back, usually a different distance from shore. This sets up a logistical constraints for a single day of survey.

Timing. Various survey time parameters were discussed ranging from July 15 through August 1. It was suggested to survey from a specific date in May and end August 15, then evaluate this in a few years.

Productivity. Is productivity part of our function? Need to prioritize our efforts. Population abundance is our primary goal. If we have good population abundance estimates annually, productivity is incorporated in population trends. Also, it can be difficult to distinguish between adults and juveniles. However, we could miss important trends if the productivity trends are negative but don't show up in the population abundance estimates until 5 or 10 years (ie, the effect is delayed). Will discuss further.

Steve Beissinger can no longer attend meetings on a regular basis. He is still interested in the effort and will participate as time allows. He enjoyed the challenges however he is over-extended.

Sampling Design Development:
Rather than try and develop one sampling design by committee, each team member will develop a sampling design for their respective area using their specific data. The group will then try and develop a unified sampling design to be implemented for the next field season in 2000. Draft sampling designs due to NB October 21, 1999. She will disseminate them to the group and set up another meeting approximately two weeks thereafter.